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AZALEAS AND RHODODENDRONS FROM SEED

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INTRODUCTION

In many cases there grow up about plants traditions of difficulty that do not have any real foundation in fact but are based upon a total or partial lack of understanding of the needs of the individual plants. For example, the idea of difficulty in raising azaleas and rhododendrons from seed has long been current and was so fully believed that the writer was discouraged from attempting the work until a large stock of plants of these species seemed desirable in connection with some projected breeding experiments. The success of the venture has been sufficient to warrant the conclusion that all the difficulties encountered can be overcome by an understanding of the requirements of the plants.

SPECIES USED IN EXPERIMENTS

The experiments have involved the seed of the following species only, and it may be possible that some modification of the practice might be necessary for other sorts.

Rhododendron arboreum Smith;
augustini Hemsl.;
calendulaceum Torr.;
californicum Hook.;
canadense Zabel;
catawbiense Pursh (including hybrids);
japonicum Suring.;
mollis Hort.;
mucronulatum Turcz.;
mucronatum G. Don;
obtusum Planch. (the "Kurume azaleas");
schlippenbachi Maxim.;
smirnovi Trautv.;
yanthinum Franch.;
yedoense poukhanense Nakai.

[1] Prepared when Mr. Morrison was attached to the former Office of Horticulture.

Of this list none of the seed has been in quantities over 1 ounce, and several have been in such small quantities as to make the results rather unimportant. All have been successfully grown with the exception of *R. smirnovi* and *R. yanthinum.* The former has grown with little vigor, which seems to be its reputation. A further study of its needs must be made. The latter did not germinate well, perhaps because of the age of the seed, a factor that can not always be controlled.

Figures 1, 2, and 3 show the various steps in the process of growing rhododendrons and azaleas from seed as illustrated by the different representatives of the family the writer has handled.

MATERIAL AND METHODS

The equipment available for the study consisted of an unheated pit roofed with ordinary hotbed sash, in which the temperatures become safe for planting about the first of April.

The seed was sown in flats of soil carefully prepared as described later, placed in pans so that watering could be accomplished from below, shaded by panes of glass and lath shades until germination was fairly complete, when the glass, but not the lath, was removed.

Transplanting into flats of the same soil mixture followed as soon as the operator could commence the work, which is tedious but not difficult and may be started, if desired, when the plants have only seed leaves. A second transplanting followed as soon as necessary to prevent crowding in the flats and was followed by a third, usually in August, into carefully prepared beds in the nursery.

There is little in this routine that differs from the raising of many other plants from seed. There are, however, certain factors that must be scrupulously observed which will determine largely the success of the whole.

The seed should be fresh. Although the seed of rhododendrons, if properly stored, will maintain its viability for a great length of time, germination is better and more complete if the seed is from the last harvest.

SOIL PREPARATION

The soil in which the seed is sown must be of proper composition and preparation. It has long been known that ericaceous plants require an acid soil, the sources of which have been widely discussed elsewhere; but since 1910, when Coville [2] published the results of his investigations of the acid soils required in blueberry culture, the relation of acidity to the successful culture of these and other ericaceous plants has been more clearly understood.

In the present experiments the soil compost was made from one-third sharp sand and two-thirds leaf soil. The latter was made by rubbing through a quarter-inch wire screen half-decayed leaves gathered in local oak woods. In collecting this leaf soil the uppermost layer of leaves is discarded, and only the second layer is taken. The lower layers, so completely decayed that the vestiges of stems and leaf veins are no longer apparent, are not used in the compost for

[2] COVILLE, F. V. EXPERIMENTS IN BLUEBERRY CULTURE. U. S. Dept. Agr., Bur. Plant Indus. Bul. 193, 100 p., illus. 1910.

seed pans, but may be used in the nursery beds. This differentiation is made because the fiber from the half-decayed veins and stems rubbed through the screen makes a soil that will not pack down and

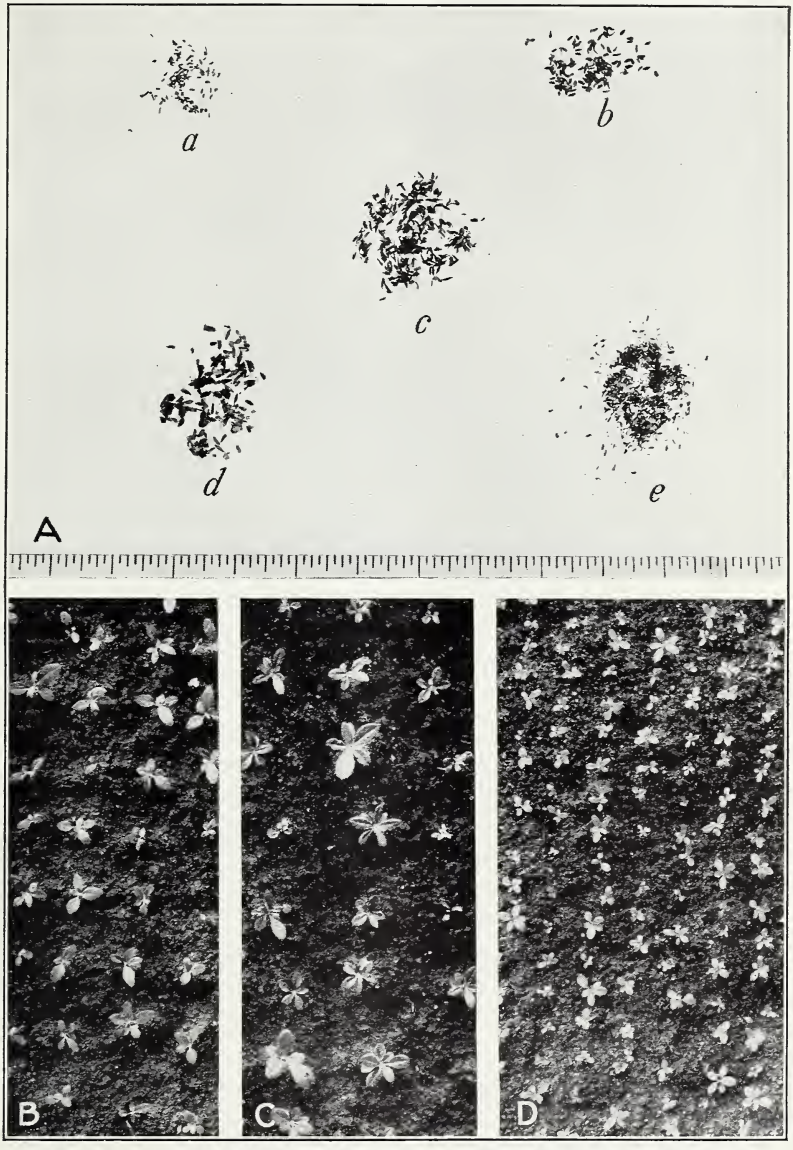

FIGURE 1.—Azalea and rhododendron seed and seedlings: A, Seed; *a*, Korean azalea; *b*, Korean rhododendron; *c*, hybrid rhododendron, Lady Clermont; *d*, Japanese azalea; *e*, Kurume azalea. B, C, D, seedlings: B, Korean rhododendron; C, Japanese azalea; D, Kurume azalea

become sodden with water, a condition fatal to the good growth of young seedlings. Some experimentation in the proportion of sand and leaf material to be mixed may be necessary in order to obtain a

mixture so porous that water will drain through it immediately and yet be sufficiently absorbed by the leaf soil to keep the whole uniformly moist but not sodden. It is probable, therefore, that in a

FIGURE 2.—Nursery plants: 1-year (A) and 2-year (B) seedlings of Korean rhododendrons; 1-year (C) and 2-year (D) seedlings of Korean azaleas

leaf soil from softer leaves than oak more sand might be required. In any case it is essential that the sand and leaf soil be mixed with the greatest care to obtain uniformity, for any pockets of leaf soil

without sand are more difficult to keep moist and once dried out are almost impossible to remoisten without complete immersion.

FIGURE 3.—Plants and transplant beds: A, 2-year plants of hybrid rhododendrons; B, transplant beds of rhododendrons; C, transplant beds of azaleas

The seed flats are filled with this mixture nearly to the rim and are pressed with a board until the soil is firm and the surface level. They should be watered thoroughly and left to drain until the next day, when the seed may be sown.

Many writers advocate the use of a layer of drainage material in the bottom of the flats, suggesting an ample layer of broken pots covered with moss to prevent the soil from clogging the rest. Notwithstanding much distinguished precedent, the writer has never used any drainage material, and by the use of the quickly draining mixture he has had no difficulty with the drainage in ordinary flats.

PLANTING AND WATERING

The seed is sown on the surface of the soil prepared as outlined, and it is then covered with a thin layer of dry sphagnum moss that has been rubbed through a mosquito-wire screen to the consistency of dust. The flats are then covered with panes of glass and set in pans of water. No watering from above is given any flat until the seedlings have been twice transplanted, at which stage the flats are placed on the benches and thereafter the water is allowed to run over the surface of the flat and is not permitted to touch the leaves of the tiny plants. In this way a considerable amount of damping off is prevented. Care must be taken to prevent damage from drip from the roof of the house. To facilitate watering from below, the writer has used pans made from large sheets of galvanized roofing by turning up the edges about 1½ inches and soldering together the corners. Each will accommodate six flats of ordinary size. They are half-filled with water as often as is necessary to keep the soil evenly moist.

The time of germination varies from two weeks to one month under ideal conditions. If the seed is sown too early in the unheated house, it lies dormant until the weather is moderately warm. The writer has found no advantage in sowing before April. May has given fair results, but later sowing is undesirable. The sowing should be so timed that the seedlings will have developed several true leaves during the cool weather that precedes summer.

TRANSPLANTING

While the seedlings are small and apparently fragile, with roots as slender as the most delicate threads, the plants are easily moved, even before the development of the first true leaf, if the operator has ample patience and a light touch. The transplant flats are prepared as for seed flats, but no sphagnum moss is used on the surface. The flats when filled with plants 1 inch apart each way are set in the water pans for several days. They can then be moved to benches where earthworms can not work up into the soil, as these soon bury the tiny plants with piles of earth from their borings. Slugs are very harmful at this time and should be trapped on leaves of lettuce or cabbage set about the house.

The best tool for transplanting is a small knife. The seedlings can almost be lifted from the sphagnum moss of the seed flat with the fingers, as they are not deeply rooted at this stage, and can be carried between the fingers of the left hand and slipped into the hole made by the knife held in the right hand. The opening is then closed by the finger tips. This is tedious to one not interested in the work. The sooner it is done the better, as seedlings with several leaves are checked in later moving.

In the writer's work the seedlings in some cases have been carried through the first summer and winter in the pit house, which has probably delayed the development of the plants. Here they are frozen lightly during the coldest months, but are protected from harm by lath shade, which tempers the rapidity of thawing. Injury usually comes from the splitting of the bark and the subsequent loss of the top. If the plants are valuable they should not be immediately discarded, as they will often start again from the base. The following spring all the seedlings are transplanted into nursery beds either before growth starts or in late July or early August as the second period of growth is beginning. Transplanting during the spring season of growth seems to check that growth in the case of the deciduous American and oriental species so that they do not make the total height that is obtained by a midsummer transplanting, but they often make a desirable branching growth in late summer and early fall.

The soil in the transplant beds must be of the same acid nature as that in the seed flats, but need not have so carefully prepared a texture. It must have greater depth, however, and adequate drainage.

In transplanting for the second and third times, the operation is simpler than it is the first time. With a sharp knife cut between the rows of seedlings, whether in flats or in nursery rows, and then between the individuals in the rows. By a careful manipulation it is then possible to lift out each plant with a rectangular mass of earth attached to its roots which penetrate the fibrous soil throughout the mass. Of course some of the roots are cut for each plant, and occasionally a large root running out from a seedling in a horizontal plane is severed to the harm of that individual, but usually there is as little damage as would be done in moving a potted plant.

SHADE

In a nursery where quantity production is the aim, it is probable that an area with overhead shading and watering would be the ideal nursery site for growing the seedlings to flowering size. In the small-scale operations of the present work, the nursery beds have been prepared where the plants would have the shade of small trees. These should be fairly high in head and so spaced that the shade cast by them does not completely cover the area but passes across the beds, giving all plants a period of entire sunlight. The trees used as shade of course are harmful in that they steal food and moisture from the supplies given the rhododendrons.

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